

TAXONOMIC NOTES ON SOME DEEP-WATER TURRIDAE (MOLLUSCA: GASTROPODA) FROM THE MALAGASY REPUBLIC

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Abstract. The ten Turridae species treated in this paper are mostly new geographical or benthic records. The identity of *Gemmula congener* (E.A. Smith) is here elucidated on the basis of its type specimen, and *G. cosmoi* (Sykes) is considered a separate species rather than a subspecies of *G. congener*. The status of the holotype of *G. philippinensis* (Powell) is discussed and *Comitas huttoni* (Suter, 1914) is the appropriate name for the species known as *Comitas fusiformis* (Hutton, 1877).

The taxonomic notes on the ten species of Turridae discussed in this paper have been based on material dredged by Prof. A. Crosnier, in deep water off "Madagascar" (= Malagasy Republic), during the years 1972-73. The material is normally housed in the Delaware Museum of Natural History, Greenville, Delaware, but has been on an extended loan to the Auckland Institute and Museum.

Family TURRIDAE

Subfamily TURRINAE Swainson, 1840

Genus *Gemmula* Weinkauff, 1875

Gemmula Weinkauff, 1875, Jahrb.deut.Malak.Gesell. 2:287. Type species by SD (Cossmann, 1896) *Pleurotoma gemmata* Reeve, 1843 (non Conrad, 1835) = *Gemmula hindsiana* Berry, 1958. Recent, California.

Gemmula (Gemmula) congener (E.A. Smith, 1894) (Figs. 1-5)

1894. *Pleurotoma congener* E.A. Smith, Ann.Mag.Nat.Hist. (6), 14:160, pl.3, figs.4,5.

1964. *Gemmula congener* subsp. *congener* (E.A. Smith), Powell, Indo-Pacif.Moll. 1(5):251, pl.191, figs.1-4.

1971.? *Gemmula (Gemmula) rarimaculata* Kuroda & Oyama, Seashells Sagami Bay, p.222, pl.57, fig.9; pl.111, fig.6; 1983 Kilburn, Ann.Natal Mus. 5(2):577, figs.9,17,50-52.

TYPE LOCALITY. Bay of Bengal, India. 128 fathoms (234 m) [*congener*]; Sagami Bay, Japan (*rarimaculata*).

Type specimen. The holotype of *G. congener* is in the Zoological Survey of India No.8513/9, length 51.4 mm, width 18.0 mm, height of aperture 23.3 mm. There are 45 gemmae on the penultimate and 48 on the body whorl (some being almost confluent towards the end of the body whorl). The shell is uniformly creamy-fawn and unspotted; the outer lip and sinus are damaged (Figs.2,3).

Material examined: Malagasy: 22° 21'06"S & 43° 04'03"E, 450 m; 15° 19'01"S & 46° 11'08"E, 400 m. Total 7 specimens.

Powell (1964) assigned 3 living and 1 fossil subspecies to the *congener* group. *Gemmula congener* is here considered to be a separate species from *G. cosmoi* (Sykes), which also occurs in Malagasy. Powell (1964) reported *G. congener* only from the northern Indian Ocean, ranging from Somalia to the Persian Gulf, India and the Philippines. In addition to the new Malagasy record, the species was also collected N.W. of Zanzibar by the John Murray Expedition in 1933-34.

Kilburn (1983) did not consider Powell's (1964) illustration of *G. congener* to be accurate and he remarked that Powell's (1964) illustration of *G. congener* was more comparable to *G. rarimaculata* Kuroda & Oyama, 1971. Having examined the holotype of *G. congener* and 20 additional specimens of the species, I consider Powell's (1964) interpretation of the species to be correct. The misunderstanding seems to be the variability of the development of the bicarinate subsutural cord. Some specimens have the subsutural cord almost of the same strength as the gemmate peripheral cord on the upper spire whorls but on the last two whorls the subsutural cord becomes lower and more discreet. In other specimens the subsutural cord is prominent to massive on all whorls; the cord can be either plain or have the appearance of being ribbed in individuals where the oblique axials intrude on to the subsutural cord. From the original description and illustration of *G. rarimaculata* and subsequent illustration of the species by Kilburn (1983), the species appears to be conspecific with *G. congener* (E.A. Smith).

***Gemmula (Gemmula) webberae* Kilburn, 1975**

(Figs.6,7)

1975. *Gemmula congener* subsp. *webberae* Kilburn, Ann.Natal Mus. 22(2):600, figs 13,14.

1983. *Gemmula (Gemmula) webberae* Kilburn, Ann.Natal Mus. 25(2):569.

TYPE LOCALITY. Off Durban, Natal, Sth. Africa, in c. 150 fathoms (275 m).

Material examined: Malagasy: 12° 43'03"S & 48° 15'07"E, 245-255 m. A single specimen, length 57.9 mm.

The species is similar to *G. congener* (E.A. Smith) but is always readily separated. In addition to the new Malagasy record, I have seen other specimens from N.W. of Zanzibar where it has been collected by the John Murray Expedition. In these specimens, the strength of the subsutural cord was as variable as in *G. congener*.



Figs. 1-7. 1-5. *Gemmula congener* (E.A. Smith). 1. Type figure (from E.A. Smith 1894, pl.3, Figs.4,5). 2,3. Holotype in Zool. Surv. India No. 8513/9; 51.4 mm. 4. Andaman Sea, 339 m, ex-"Investigator"; 38.4 mm (specimen with fewer gemmae on cords). 5. Malagasy, 450 m; 36.3 mm (slender form). 6,7. *G. webberae* Kilburn. 6. Malagasy, 245-255 m; 57.9 mm. 7. Off N.W. Zanzibar, 212 m; 50.7 mm.

Gemmula (Gemmula) cosmoi (Sykes, 1930)

(Fig.8)

1930. *Turris cosmoi* Sykes, Proc.Malac.Soc.Lond. 19:82, textfig.
 1964. *Gemmula congener* subsp. *cosmoi* (Sykes), Powell, Indo-Pacif. Moll. 1(5):252, pl.192.
 1983. *Gemmula (Gemmula) cosmoi* (Sykes), Kilburn, Ann.Natal Mus. 25(2):567, figs.8,14,33-36.

TYPE LOCALITY. Kii, Japan.

Material examined: Malagasy: 12°17'03"S & 43°02'07"E, 600-605 m; 12°39'08"S & 48°15'02"E, 375-385 m; 22°14'08"S & 43°04'07"E 450 m; 15°18'S & 46°12'01"E, 480-510 m; 22°17'09"S & 43°04'E, 450 m; 12°43'01"S & 48°11'01"E, 540 m; 23°36'04"S & 43°31'01"E, 450-460 m; 22°21'06"S & 43°04'03"E, 450 m; 22°14'07"S & 43°04'05"E, 470-475 m; 15°19'S & 46°11'08"E, 405 m; 15°19'01"S & 46°11'08"E, 400m; 15°24'05"S & 46°02'E, 250-265 m; 23°36'01"S & 43°31'E, 445 m. Total 54 specimens.

Powell (1964) considered *G.cosmoi* to be a subspecies of *G.congener*, however, Kilburn (1983) subsequently separated *G.cosmoi* from *G.congener*. This separation is confirmed by the occurrence of both species in Malagasy and absence of any intergrading individuals. *G.cosmoi* is more closely related to *G.speciosa* (Reeve) than it is to *G.congener*.

Powell (1964) considered *G.cosmoi* to be endemic to Japan, but Kilburn (1983) subsequently reported the species from Natal and southern Mozambique. This range is now extended to Malagasy where the species is moderately common in dredgings.

Gemmula (Gemmula) kieneri (Doumet, 1840)

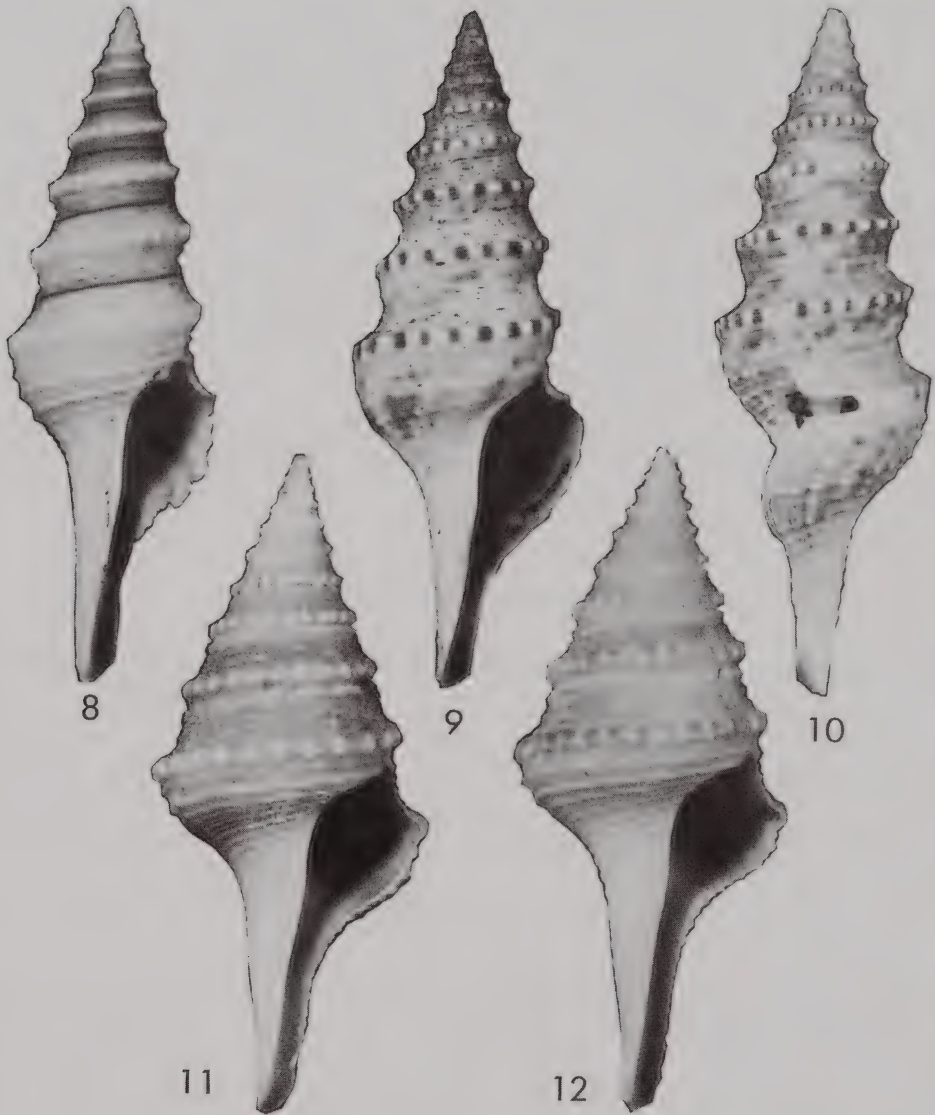
(Figs.9,10)

1840. *Pleurotoma kieneri* Doumet, Magasin de Zool. 2:2, pl.10.
 1843. *Pleurotoma carinata* Reeve, Conch.Icon. 1:pl.7, fig.56 (non Link, 1808; nec Gray in Griffith & Pidgeon, 1834).
 1964. *Gemmula kieneri* (Doumet), Powell, Indo-Pacific. Moll. 1(5): 246, pl.186, figs.2,3.
 1983. *Gemmula (Gemmula) kieneri* (Doumet), Kilburn, Ann.Natal Mus. 25(2):569, figs.7,13,37,38,40.

TYPE LOCALITY. None.

Material examined: Malagasy: 15°14'05"S & 46°11'08"E, 405 m; 15°19'01"S & 46°11'08"E, 400 m; 12°27'S & 48°08'05"E, 695-705m; 23°36'01"S & 43°31'E, 445 m; 12°46'05"S & 48°10'04"E, 495-500m; 12°42'04"S & 48°14'03"E, 285-295 m; 12°43'S & 48°15'E, 300-340 m; 22°14'08"S & 43°04'07"E, 450 m; 12°49'02"S & 48°12'01"E, 445-455 m; 15°20'05"S & 46°09'E, 310-350 m; 18°54'S & 43°55'E, 280-310 m; 12°39'08"S & 48°15'02"E, 375-385 m; 21°25'05"S & 43°14'05"E, 425-550 m; 12°43'01"S & 48°11'01"E, 540 m; 23°36'04"S & 43°31'01"E, 450-460 m; 22°17'09"S & 43°04'E, 450 m; 22°17'03"S & 43°02'07"E, 600-605 m; 12°52'04"S & 48°10'04"E, 400-410 m; 22°14'07"S & 43°04'05"E, 470-475 m; 12°41'03"S & 48°16'E, 308-314 m. Total 95 specimens; largest 60.0 mm in length.

This is one of the commonest turrid species in Malagasy dredgings.



Figs. 8-12. 8. *Gemmula cosmoi* (Sykes). Malagasy, 450 m; 48.3 mm. 9,10. *G.kieneri* (Doumet). 9. Malagasy, 445 m; 57.0 mm. 10. Malagasy, 600-605 m; 60.4 mm. 11,12. *G.aethiopica* (Thiele). 11. Malagasy, 550-555 m; 32.4 mm. 12. Malagasy, 405 m; 38.0 mm.

Gemmula (Gemmula) aethiopica (Thiele, 1925) (Figs.11,12)

1925. *Pleurotoma (Gemmula) aethiopica* Thiele, Wiss.Ergeb.deut.Tief.Exped. "Valdivia" 17(2):174, pl.22, fig.25.
 1964. *Gemmula aethiopica* (Thiele), Powell, Indo-Pacif.Moll. 1(5):257, pl.196, fig.5.

TYPE LOCALITY. Off Somalia, E.Africa, 0°27.4'S & 42°47.3'E, 638 m.

Material examined: Malagasy: 22°17'03"S & 43°02'07"E, 600-605 m; 23°34'S & 43°29'06"E, 600-610 m; 23°35'05"S & 43°28'06"E, 710-760 m; 12°42'02"S & 48°14'02"E, 395-405 m; 15°19'S & 46°11'08"E, 405 m; 22°25'S & 43°04'05"E, 550-555 m; 18°54'S & 43°55', 280-310 m. Total 20 specimens.

Thiele (1925) counted 32 nodules on the peripheral cord of the body whorl. The number of nodules in specimens examined varied from 22-36 and the number of spiral threads was also found to be variable.

Subgenus **Pinguiggemmula** MacNeil, 1960

Pinguiggemmula MacNeil, 1960, U.S.Geol.Surv.Prof.Pap. 339:103. Type species by OD *P.okinavensis* MacNeil, 1960. Recent, Indo-Pacific.

Gemmula (Pinguiggemmula) philippinensis (Powell, 1964) (Figs.13,14)

1964. *Pinguiggemmula philippinensis* Powell, Indo-Pacific.Moll. 1(5):278, pl.215, figs.5,6.

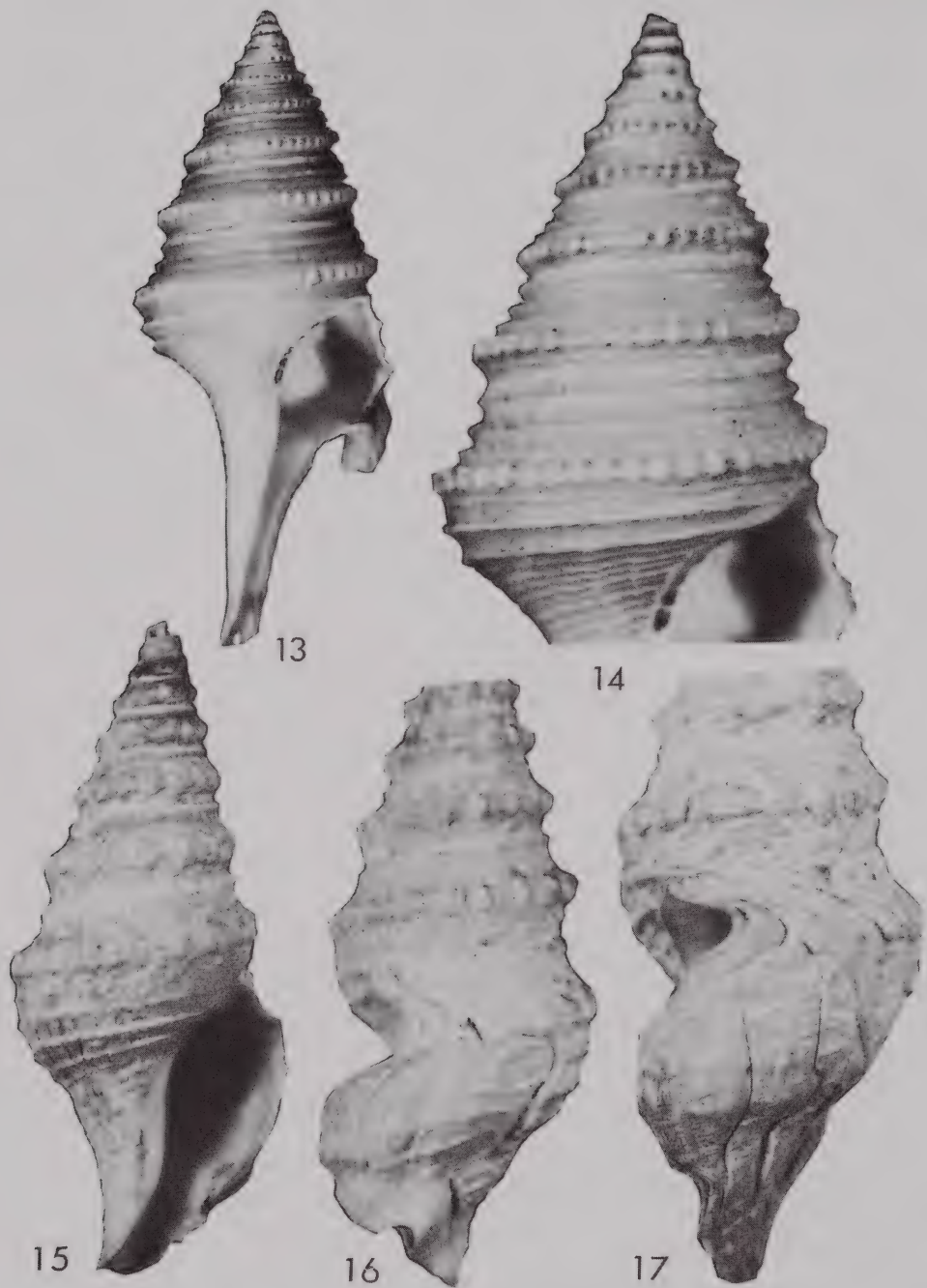
TYPE LOCALITY. Off Santiago, W.Luzon, Philippines, 280 fathoms (512 m).

The opportunity is taken to correct an error made by Powell (1964, 1966) in illustrating the holotype of *G.philippinensis*. In 1964 (pl.215, figs.5,6) Powell illustrated a specimen with a malformed sinus growth as the "holotype" of *G.philippinensis*, and gave the measurements as 50.2mm. In 1966 (pl.6, fig.5), Powell once again illustrated the same specimen as the holotype. The holotype, however, is in the National Museum of Natural History, Washington, length 50.2 mm, and has been correctly illustrated by Abbott & Dance (1982). The specimen illustrated by Powell on both occasions (1964, 1966) is a paratype which is in the Powell collection and measures length 43.5 mm (Figs.13,14).

Kilburn (1971) synonymized *G.philippinensis* (Powell) with *G.thielei* (Finlay, 1930) from East Africa.

Subgenus **Ptychosyrinx** Thiele, 1925

Ptychosyrinx Thiele, 1925, Wiss.Ergeb.deut.Tief.Exped."Valdivia" 17(2):210. Type species by OD *Pleurotoma (Subulata) bisinuata* v.Martens, 1901. Recent, East Africa.



Figs. 13-17. 13,14. *Gemmula (Pinguiggemula) philippinensis* (Powell). Paratype from off Santiago, W.Luzon, Philippines, 512 m; 43.5 mm. 15-17. *Gemmula (Ptychosyrinx) bisinuata* (v.Martens). 15. Malagasy, 1,200 m; 45.8 mm. 16. Side-view of younger specimen; 38.7 mm. 17. Side-view of senile specimen; 45.8 mm.

Gemmula (Ptychosyrinx) bisinuata (v.Martens, 1901) (Figs.15-17)

1901. *Pleurotoma (Subulata) bisinuata* v.Martens, Sitzb.Gesell. Nat.Freunde Berlin p.17.
 1903. *Drillia (Subulata) bisinuata* v.Martens, Wiss.Ergeb.deut.Tief.Exped. "Valdivia" 7:82, pl.1, fig.8.
 1964. *Ptychosyrinx bisinuata* (Martens), Powell, Indo-Pacific.Moll. 1(5):289, pl.223, figs.1,2.

TYPE LOCALITY. St.264, near the coast of Somalia, 6°18'N & 49°32'E, in 1079 m, Globigerina-mud.

Material examined: Malagasy: 22°20'03"S & 42°59'E, 995-1020 m; 22°16'09"S & 42°56'E, 1200 m; 22°18'02"S & 43°00'05"E, 880-920 m. Total 9 specimens.

Powell (1964) considered the bisinuate nature of the outer lip to be an abnormality. However Malagasy specimens with an entire aperture clearly show the feature of a bisinuate outer lip. An outer lip with a double sinus occurs occasionally in other species of *Gemmula*, such as *G.graeffei* (Weinkauff), or the illustrated examples of *G.webberae* Kilburn (Fig.6,7) and *G.philippinensis* (Powell) [Fig.13,14]. The double sinus does appear to occur more frequently in *G.bisinuata* than other *Gemmula* species.

Subfamily COCHLESPIRINAE Powell, 1942

[formerly TURRICULINAE Powell, 1942]

Genus **Comitas** Finlay, 1926

Comitas Finlay, 1926, Trans.N.Z.Inst. 56:251. Type species by OD *Surcula huttoni* Suter, 1914. Tertiary of New Zealand.

Powell (1969) used the name *Comitas fusiformis* (Hutton, 1877) for *Surcula huttoni* Suter. Since Hutton's "*Drillia fusiformis*" has been replaced as a secondary homonym prior to 1961, the taxon remains permanently rejected (Art.59 of ICZN 1985).

Comitas kaderlyi (Lischke, 1872) (Fig.18)

1872. *Pleurotoma kaderlyi* Lischke, Malakozool. Blaetter 19:100.
 1969. *Comitas kaderlyi* (Lischke), Powell, Indo-Pacif.Moll. 2(10):265, col.pl.192, figs.12-14; pl.216, fig.3.

TYPE LOCALITY: Bay of Yedo, Japan.

Material examined: Malagasy: 15°19'S & 46°11'08"E, 405 m; 22°17'03"S & 43°02'07"E, 600-605 m; 15°18'S & 46°12'01"E, 480-510 m; 22°17'09"S & 43°04'E, 450 m; 18°54'S & 43°55'E, 280-310 m; 22°14'08"S & 43°04'07"E, 450 m. Total 9 specimens.

Powell (1969) reports the species from the Philippine-Japanese region and the Malagasy record is a considerable westward range extension into the Indian Ocean. The largest specimen examined measured 80.4 mm in length.

Comitas eurina (E.A. Smith, 1899) (Figs.19,20)

1899. *Pleurotoma (Surcula) eurina* E.A. Smith, Ann.Mag.Nat.Hist. (7), 4:239; 1909 Annandale & Stewart, Illust.Zool. "Investigator", Moll. Pt.6:pl.9, figs.4,4a.
1969. *Comitas eurina* (E.A. Smith), Powell, Indo-Pacific.Moll. 2(10):268, pl.217, figs.4,5.

TYPE LOCALITY. Off south of India, 430 fathoms (878 m).

Material examined: Malagasy: 15°19'S & 46°11'08"E, 405 m; 15°19'01"S & 46°11'08"E, 400 m; 23°36'01"S & 43°31'E, 445 m. Total 3 specimens.

Powell (1969) reported the species only from India and Indonesia, and the Malagasy record extends the species range into the southwest Indian Ocean. Specimens examined were uniformly pale orange-brown in colour and the spiral threads over the shoulder sulcus were either distinct or obsolete. Largest specimen examined measured 58.0 mm in length.

Genus *Marshallena* Allan, 1927

Marshallena Allan, 1927, Trans.N.Z.Inst. 57:291. Type species by SD (Finlay, 1927) *Belophos incertus* Marshall, 1919 = *Daphnella neozelanica* Suter, 1917. Tertiary of New Zealand.

Powell (1966) cited *Daphnella neozelanica* Suter, as the type species by monotypy but later Powell (1969) amended this to a type selection by original designation. Allan (1927) cited 5 species in the genus *Marshallena* without actually selecting a type species for the genus, and the type species was subsequently selected by Finlay (1927).

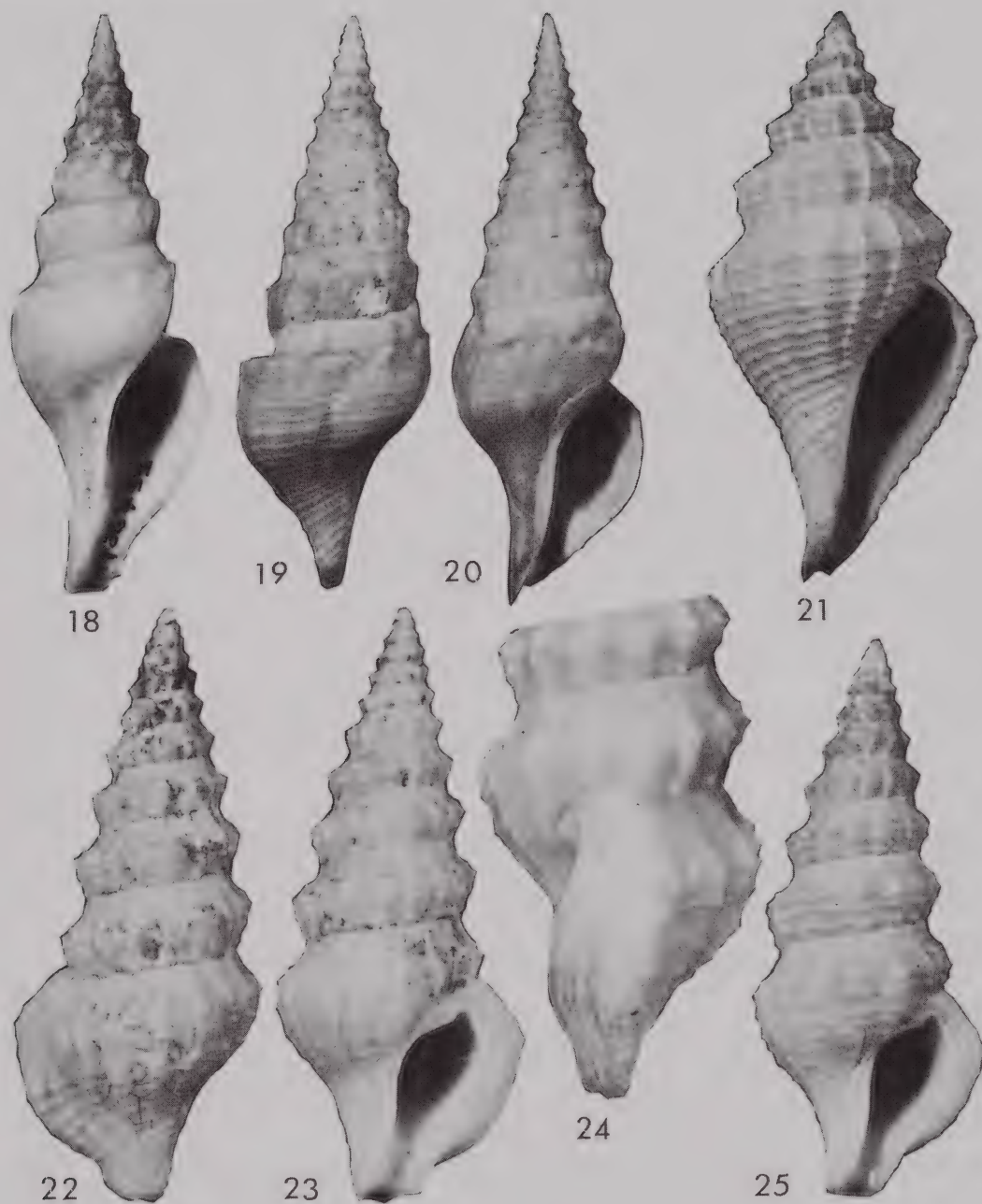
Marshallena philippinarum (Watson, 1882) (Fig.21)

1882. *Fusus (Metula) philippinarum* Watson, J.Linn.Soc.London 16:373; 1886 Watson, Sci.res."Challenger" Exped.Zool. 15:210, pl.12, fig.1.
1969. *Marshallena philippinarum* (Watson), Powell, Indo-Pacif. Moll. 2(10):369, pl.277, figs.7-11; pl.278; 1973 Kilburn, Ann.Natal Mus. 21(3):572, fig.13b.

TYPE LOCALITY. St.210, Philippine Islands, 9°26'N & 123°45'E, 375 fathoms (686 m), mud.

Material examined: Malagasy: 15°19'01"S & 46°11'08"E, 400m. A single specimen, length 15.8 mm.

Kilburn (1973) was the first to report a southwest range extension on the basis of a single specimen taken 100 km east of Inhaca I, southern Mozambique, in 476 m. The Malagasy record confirms the existence of *M.philippinarum* in East African waters.



Figs. 18-25. 18. *Comitas kaderlyi* (Lischke). Malagasy, 450 m; 74.3 mm. 19,20. *C.eurina* (E. A. Smith). Malagasy, 400-405 m. 19. 53.3 mm. 20. 57.5 mm. 21. *Marshallena philippinarum* (Watson). Malagasy, 400 m; 15.8 mm. 22-25. *Horaiclavus* (*Anguloclavus*) *multicostatus* (Schepman). 22,23. Malagasy, 405 m; 26.2 mm. 24. Side-view of a 17.6 mm specimen. 25. Malagasy, 445 m; 20.9 mm.

Subfamily DRILLIINAE Olsson, 1964

This subfamily name replaces the homonymous Clavinae Casey, 1904 (non McCrady, 1859). It should be noted that Drilliinae Olsson, 1964, has chronological priority over Drilliinae Morrison, 1966.

Genus **Horaiclavus** Oyama, 1954

Horaiclavus Oyama, 1954, Palaeont.Soc.Japan Spec.Pap.No.2:52. Type species by OD *Mangilia splendida* A.Adams, 1867. Recent, Japan.

Subgenus **Anguloclavus** Shuto, 1983

Anguloclavus Shuto, 1983, Mem.Fac.Sci.Kyushu Univ.,ser.D,Geol. 25(1):9. Type species by OD *Mangilia multicostata* Schepman, 1913. Recent, Indian Ocean.

Horaiclavus (Anguloclavus) multicostatus (Schepman, 1913) (Figs.22-25)

1913. *Mangilia multicostata* Schepman, Siboga Exped. 49:432, pl.28, fig.12.

1983. *Horailavus*[sic](*Anguloclavus*)*multicostatus* Schepman, Shuto, Mem.Fac.Sci.Kyushu Univ.Geol. 25(1):10, pl.1, figs.9,10, textfigs.6/6-10.

TYPE LOCALITY. St.260, near north point of Nuhu Jaan, Kei Islands [Indonesia], in 90 m.

Material examined: Malagasy: 23° 36'01"S & 43° 31'E, 445 m; 15° 19'S & 46° 11'08"E, 405 m. Total 4 specimens.

Powell (1966) listed *Horaiclavus* Oyama, to be doubtfully turrid, since there was no vestige of a sinus on the outer lip. Three of the four specimens examined have a partially broken peristome and thus an undefined sinus, but one specimen with a complete peristome shows a shallow sinus of about the same magnitude as some species of *Marshallena* Allan or *Pusionella* Gray (Fig.24). Some species of the mitromorphine genera *Mitromorpha* Carpenter or *Mitrolumna* Bucquoy, Dautzenberg and Dollfus, show only an obsolete, almost imperceptible sinus. The radula of *Horaiclavus* has, however, been confirmed as toxoglossate (Kuroda, Habe & Oyama 1971). Shuto (1983) subsequently reported the species from c. 240 km N. of Coburg Peninsula (9° 17.5'S & 132° 20'E), Northern Territory, Australia (one holed specimen). He acknowledged the species as turrid on the basis of a toxoglossate radula in *Horaiclavus splendidus* (A.Adams), and created the subgenus *Anguloclavus* for *Mangilia multicostata* Schepman.

The four Malagasy specimens range in size from 17.6 mm — 26.2 mm, with 8½-10¼ whorls of the teleoconch and a protoconch of 1¼ whorls; the number of axial ribs on the penultimate whorl varies from 13-16. Sculpture is variable, some individuals have 4-5 spirals on the anterior two-thirds of the spire whorls more distinct than others. The outer lip is prominently varicose and the peristome is rather fragile,

the aperture is edentulous except for the parietal swelling and the columella is calloused. The colour is uniformly cream and the aperture white.

The Malagasy record is a considerable geographic as well as bathymetric range extension for the species.

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